NASA-USDA SMAP Global Soil Moisture Data

The NASA-USDA SMAP Global soil moisture data provides soil moisture information across the globe at 0.25°x0.25° spatial resolution. This data set includes: surface and subsurface soil moisture (mm), soil moisture profile (%), surface and subsurface soil moisture anomalies (-).The data set is generated by integrating satellite-derived Soil Moisture Active Passive (SMAP) Level 3 soil moisture observations into the modified two-layer Palmer model using a 1-D Ensemble Kalman Filter (EnKF) data assimilation approach. Soil moisture anomalies were computed from the climatology of the day of interest. The climatology were estimated based on the full data record of the SMAP satellite observation and the 31 day centered moving window approach. The assimilation of the SMAP soil moisture observations help improve the model-based soil moisture predictions particularly over poorly instrumented areas of the world that lack good quality precipitation data. This dataset was developed by the Hydrological Science Laboratory at NASA's Goddard Space Flight Center in cooperation with USDA Foreign Agricultural Services and USDA Hydrology and Remote Sensing Lab.

Data Availability:

01 April 2015 – present

3-days composites

Spatial coverage:

180°W – 180°E, 60°N-60°S

Band name:

Band	Band Name	Description	units
0	ssm	Surface soil moisture	mm
1	susm	Subsurface soil moisture	mm
2	smp	Soil moisture profile	(%)
3	ssma	Surface soil moisture anomaly	-
4	susma	Subsurface soil moisture anomaly	-

File Format:

NASA-USDA SMAP Global Soil Moisture Data are in Georeferenced Tagged Image File Format (GeoTIFF) which is an open file format and stores geo-reference information with in a TIFF file.

Property	Value
Columns and Rows	1440,600
Number of Bands	5
Cell Size	0.25,0.25
Spatial Reference	GCS_WGS_1984
Extent (Top, Left, Right, Bottom)	60,-180,180,-60

File Naming Convention:

NASA-USDA SMAP Global Soil Moisture data sets are named in accordance with the following convention:

NASA_USDA_SMAP_SM<start date>_<end date>.tiff

Attribute	Description
start date	<YYYYMMDD>, start date of the composite period
end date	<YYYYMMDD>, end date of the composite period

For examples, file name for 3-day composites for the start date of April 2, 2015 and end date of April 4, 2015 is "NASA_USDA_SMAP_SM20150402_20150404.tiff"

Provider:

NASA Goddard Space Flight Center, Greenbelt, MD.

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References:

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